



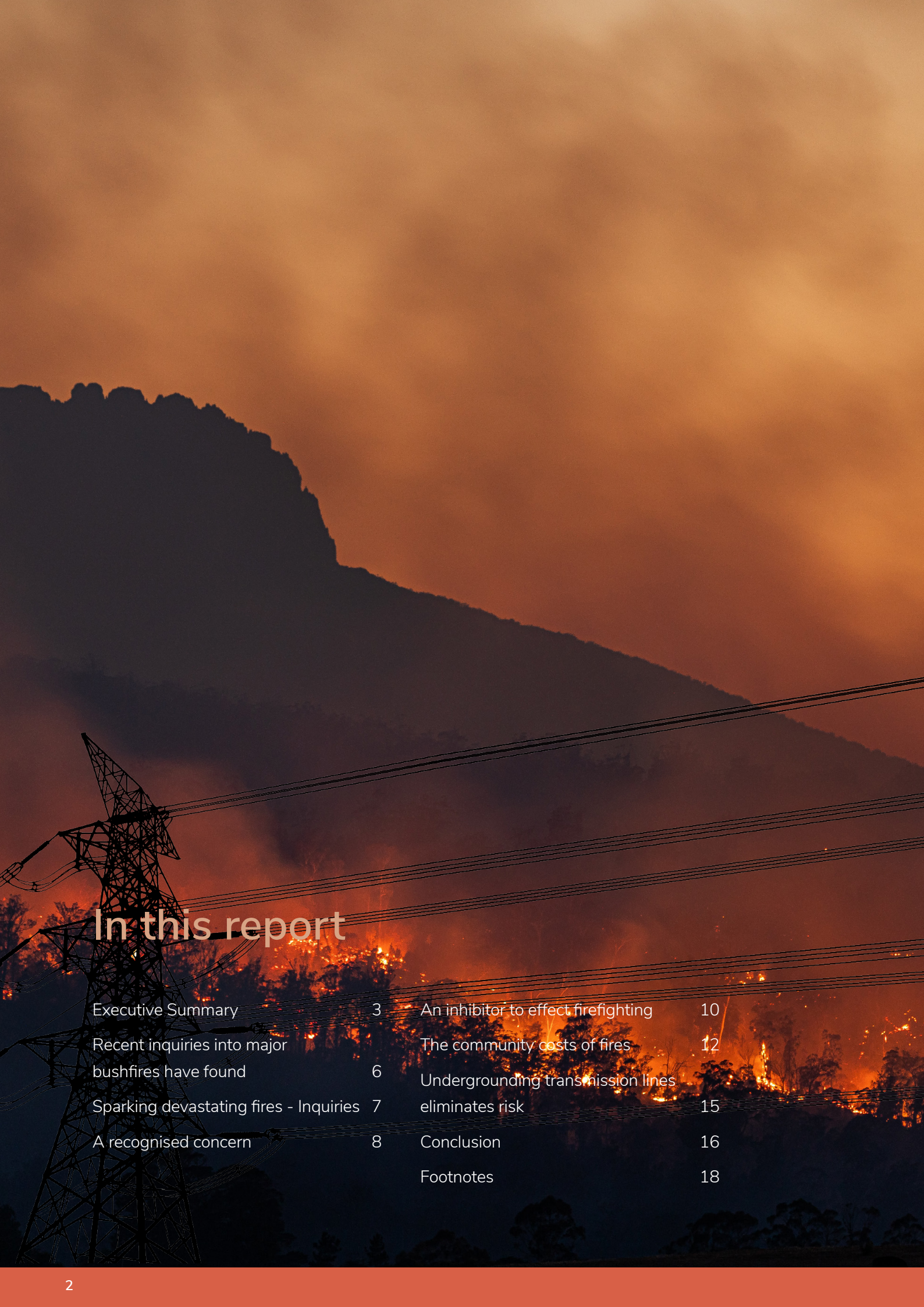
Why are we super-charging bushfire risks in a changing climate?

The shocking truth about the risks of overhead transmission lines on fire-prone communities



Joint report by

The HumeLink Action Group,
and HumeLink Alliance



In this report

Executive Summary	3	An inhibitor to effect firefighting	10
Recent inquiries into major bushfires have found	6	The community costs of fires	12
Sparking devastating fires - Inquiries	7	Undergrounding transmission lines eliminates risk	15
A recognised concern	8	Conclusion	16
		Footnotes	18

Executive Summary



“This is exactly what the scientists have warned us would happen. Longer drier periods, resulting in more drought and bushfire. If this is not a catalyst for change, then I don’t know what is. This is not normal and doing nothing is not a solution. We need to reduce our carbon emissions immediately, and we need to adapt our practices to deal with this kind of weather becoming the new normal.”

Matt Kean
The NSW Treasurer and
Minister for Energy



Despite overwhelming evidence that overhead electricity transmission lines increase the risks of tragic loss of life and property in bushfire-prone areas during a global warming event, our governments continue to build these structures.

These decisions are based on flawed and short-sighted economic thinking, and ignore the findings of numerous bushfire inquiries, **even in areas that are still recovering from the 2019-2020 Black Summer Fires.**

Government's are failing to capture the broader public interest – protecting the community from bushfires and preventing environmental destruction from this dangerous, out-dated, inefficient and unreliable energy infrastructure.

In recent years, investigations into major and destructive bushfires in Australia have recommended undergrounding electricity transmission lines to minimise risks of sparking fires and impeding fire fighting.

The Australasian Fire and Emergency Service Authorities Council has again warned NSW that we need to prepare for “above normal fire potential” during this summer, exacerbated by record rainfall which is expected to create significant fire fuel loads

Yet, the New South Wales and Federal Governments are continuing to push ahead with multi-billion-dollar projects that pose a clear and present danger to the lives of tens of thousands of citizens, firefighters and millions of native animals and plants because they believe that overhead towers are the “cheapest” way to get energy from point A to point B, ignoring the potential loss of life and environmental devastation.

In the case of Transgrid’s proposed HumeLink project in Southern NSW, the company is planning to build 360km of overhead power lines across national parks, state forests and prime farming land, significantly increasing bushfire risks for communities and native animal populations devastated by the 2019-20 fires.

This proposed infrastructure will present bushfire risks for the life of the structure, which will be some 80 years and ignores Transgrid’s own assessment in its Red Hat Review that identified “a high degree of bushfire risk along parts of the route.”¹

Alarmingly, the greenhouses gases produced by bushfires started by transmission lines have the potential to wipe out any gains made by renewable energy generation, with one study showing that the 2019/20 Black Summer fires more than doubled Australia’s annual carbon footprint.²

Executive Summary Continued

Bizarrely, while proven and safe technologies like undergrounding are available, Transgrid is moving ahead with the towers because they are the “cheapest” way to distribute renewable energy to fight climate change – the very same issue that is increasing the frequency, severity and intensity of bushfires in Australia and around the world, making these transmission lines more dangerous.

It is well recognised by scientists, firefighters and politicians alike, that global warming has increased the frequency and severity of bushfires, with Minister for Climate Change and Energy, Chris Bowen, in his recent Annual Climate Change Statement to Parliament on 1 December 2022 stating: “Our country was devastated by the Black Summer bushfires just a few years ago. But as frightening as that bushfire season was, the absence of action will see the temperatures and conditions of that year become the norm by the 2040s and become a “good year” by the 2060s.”³

The NSW Treasurer and Minister for Energy, Matt Kean said about the Black Summer fires: This is “exactly what the scientists have warned us would happen. Longer drier periods, resulting in more drought and bushfire. If this is not a catalyst for change, then I don’t know what is. This is not normal and doing nothing is not a solution. We need to reduce our carbon emissions immediately, and we need to adapt our practices to deal with this kind of weather becoming the new normal.”⁴

Similarly, it is well recognised in several recent bushfire inquiries that overhead powerlines not only start deadly bushfires, but also hamper our efforts to fight them because of the clear dangers that they present to firefighters on the ground and in the air.

Australia’s Black Summer bushfires scorched more than 24 million hectares of land and took directly and indirectly more than 450 lives.

And yet we continue to build infrastructure that will make the situation worse.

In 2019/2020, Australia’s Black Summer bushfires scorched more than 24 million hectares of land and took the lives, directly and indirectly, of more than 450 people. In NSW⁵, over the course of a few months, almost 2500 homes⁶ were destroyed and the impact on communities, farmers, businesses and bushland was unprecedented.

There are many contributors to bushfire risks, though investigations into recent destructive bushfires have identified overhead transmission lines as the cause of some of the most destructive fires in recent years.

A NSW inquiry into the 2019-20 Black Summer bushfires⁷ noted that NSW RFS believed power lines were a suspected cause of a few of the larger, damaging fires.⁸

Likewise, an investigation into four emergency-level fires in Western Australia, found two were the result of overhead transmission lines. And the 2009 Victorian Bushfire Royal Commission found that the state had suffered a long history of electricity assets causing bushfires, including five of the 11 major fires of the Black Saturday bushfires.

California takes action on overhead powerlines

Across the U.S. wildfires are increasing both in frequency and intensity, a trend expected to accelerate with climate change. Core fire seasons are on average 78 days longer than they were in the 1970s,⁹

“All of our infrastructure really is designed with an assumption that the future is going to be like the past. But we’re finding, obviously, that’s not necessarily the case ... most infrastructure is well past its design lifetime expectancy and with climate change, you’ve got an acceleration of that degradation.”

“If we want to minimize wildfires, if we want to minimise the risk to our reliability, start undergrounding.”¹⁰

Paul Chinowsky of Resilient Analytics

In addition to the risks of fire, transmission lines impede firefighting efforts on the ground and in the air, due to the exclusion zones under, around and above the lines due to the potential for arcing. Arcing is the flash over caused by very high volumes of electricity jumping from wire to wire or wire to earth in a situation where heat and smoke have made the air more conductive.

These concerns have seen various inquiries into fires across the world make recommendations for transmission lines to be taken underground, with some jurisdictions such as California, committing to a program to underground lines. Already, Pacific Gas and Electricity Company (PG&E) has placed at least 175 miles (281 kms) since the commitment was made.

PG&E's Jamie Martin said the move to undergrounding was "a onetime investment to eliminate essentially all ignition risk related to power lines, with the added benefit of reducing reliability issues. It's permanent risk reduction."


In addition to the obvious risk to communities and the environment, overhead powerlines in bushfires are also incredibly unreliable as a means of powering the nation, an issue that could also be overcome by undergrounding. An overview of 2019-20 Black Summer Bushfires showed that damage to Transgrid's Network caused 65 outages of 330kv lines in Snowy Valleys area during the Dunn's Rd Fire alone!

Based on this communities demand that governments from all levels, energy regulators and network developers such as Transgrid ensure that future transmission projects, as part of Rewiring the Nation to support the move to renewable energy, including the 360 Kilometre HumeLink, minimise the real risk it presents for bushfires by going underground, particularly in fire-prone areas.

While the cost of undergrounding continues to be wildly exaggerated by Transgrid and others, there is no doubt that upfront costs will be higher but will also lead to significant reductions in costs over the medium to long term due to the elimination of bushfire risks and significantly reduced maintenance, as well as much better network reliability and efficiency.

As such, we strongly believe the funding for undergrounding could and should be subsidised by government, rather than energy users, because of the obvious long-term benefits this vital infrastructure will provide to our entire community in terms of safety, reliability, and environmental outcomes.

These issues require urgent decision making from policy-makers who have the vision and conviction to properly invest in Australia's long-term sustainable energy future.



2009 Victorian Bushfire Royal Commission found that the state had suffered a long history of electricity assets causing bushfires.

Safety Risks Ignored by Energy Companies

Energy Safe Victoria has 24 charges against United Energy for allowing trees to grow too close to overhead powerlines in high bushfire risk areas across the Mornington Peninsula.¹¹

But its most recent safety performance report on Victorian electricity networks from October 2022 states: "This is particularly concerning in Victoria's hazardous bushfire risk areas (HBRA), where escalating vegetation noncompliance rates increases the likelihood of bushfires starting when trees touch bare powerlines."¹²

Recent inquiries into major bushfires found overhead lines started numerous fires, including;

Five of the 11 major fires of Victoria's 2009 Black Saturday, which killed 173 people, injured 414 people and burned through 450,000 hectares of land;¹⁴

The 2013 Blue Mountains bushfires that engulfed Winmalee and Springwood, razing 196 homes;¹⁵

California's second largest wildfire in history, the 2021 Dixie Fire, which burned 463,000 hectares before being contained;¹⁶

A number of fires in NSW and WA in the 2019/2020 Black Summer Fires that scorched more than 24 million hectares of land and took the lives, directly and indirectly, of more than 450 across the country.

"Powerlines, lightning and deliberate ignitions are the main causes of wildfires that destroyed houses. Powerlines were six times more common in the wildfires that destroyed houses data than in the wildfires where no houses were destroyed data and lightning was two times more common."¹⁷

- Wollongong University

Sparking devastating fires - Inquiries

Over our history there are many examples where devastating bushfires have been started as a result of overhead transmission lines.

Research suggests that up to 50 per cent of major fires are ignited by faults in distribution networks when weather conditions elevate fire risk.¹⁸

The **2009 Victorian Bushfire Royal Commission**¹⁹ highlighted that the State has a history of electricity assets causing bushfires. In 1969 and 1977, the failure of electricity assets—including the clashing of conductors, conductors contacting trees and inefficient fuses—caused major bushfires.

Its report found history was repeated on February 7, 2009, when five of the 11 major fires that began that day were caused by failed electricity assets. Among the fires was one at Kilmore East in which 119 people died. The Report found overhead electrical assets can result in the ignition of a number of fires each year due simply to the existence of an energy source being exposed to natural elements.

An investigation into four emergency-level fires in **Western Australia in February 2020**, part of the Black Summer fires, which struck regional WA destroying homes, livestock, and vulnerable native bushland, found two of the fires were started by the clashing of conductors on overhead transmission lines.

The NSW Bushfire Inquiry Report²⁰ noted that high voltage overhead powerlines are a hazard that can lead to bushfires and the NSW RFS believe that a number of the larger, damaging fires in 2019-20

were caused by overhead powerlines.

The threat of electricity lines causing fire risks is recognised by Energy Networks Australia, which states: “Electricity can start bushfires when infrastructure is damaged or foreign objects contact powerlines. This can cause arcing and generate sparks that can ignite dry vegetation.”²¹

Research published in *Landscape and Urban Planning*²² found strong evidence that fires caused by electrical infrastructure were not only more prevalent during elevated fire danger conditions, but also burn larger areas than fires ignited by most other causes. As a result, the consequences of fires caused by electricity infrastructure are often worse than fires started by other means.

This was supported by research by Wollongong University study²³ which found that powerline caused ignitions were the most over-represented cause of bushfires with the most houses destroyed. The study says, “Powerlines, lightning and deliberate ignitions are the main causes of wildfires that destroyed houses. Powerlines were six times more common in the wildfires that destroyed houses data than in the wildfires, where no houses were destroyed, and lightning was two times more common.”

A recognised concern

The risk of bushfires from the proposed overhead transmission lines is well recognised by Transgrid, and during discussions with the community have admitted that they are “stuck on the bushfire issue”.

At the Transgrid Snowy Valleys CCG ‘Pilot’ Bushfire Management Workshop on 27 July 2022, some 11 questions were taken on notice relating to bushfire issues, which following consultation with Transgrid’s subject matter experts. Transgrid has so far failed to respond.

However, it was clear in the meeting that Transgrid have major concerns around bushfire risks of overhead lines, advising that: “At the camp for our workers, we will be putting the distribution powerlines underground for the protection of our workers.”

This is further evidenced by a Red Hat Review of the HumeLink route options in Tumut and Bannaby by Macroplan’s Brendan Nelson which found all the route options being considered in the Tumut area have a high degree of bushfire risk.

At a presentation of the Red Hat Review at the HumeLink Community Consultative Group meeting in September 2022, it was stated there was no single overhead transmission option which eliminates the bushfire risk and impact on the community.

The Undergrounding report by Transgrid’s consultants GHD also notes the risks of the proposed overhead powerlines in its non-market comparison.

It lists the negatives of overhead lines as:

- Overhead lines (and transition stations) are above ground. Increasing the risk for bushfire ignition.
- Overhead lines can restrict access for bushfire fighting as opposed to underground lines, which would have no or negligible impact.
- Bushfires spreading through forest (native and plantation) in severe weather conditions can cause major damage to overhead transmission lines, particularly where uphill fire spread exacerbates fire intensity.
- Bushfires spreading through forest (native and plantation) in severe weather conditions can cause major damage to property and seriously endanger the lives of those living in the area and firefighters

The underground report notes that whilst it is rare for overhead 500kV lines to experience faults causing bushfire ignition, 330kV overhead lines are known to have caused bushfire ignition.

Conversely, the report states the positives of undergrounding as:

- Full undergrounding of all circuits results in there being negligible potential for bushfire ignition.
- Full undergrounding of all circuits results in there being negligible potential for above ground bushfire to impact and damage undergrounded assets.



In an EnergyConnect technical paper²⁴, Transgrid acknowledges and lists the numerous bushfire risks associated with high voltage transmission lines as:

- trees or tree branches falling/touching conductors and bird strikes
- equipment malfunction – transmission line failure including damage caused by high winds, lightning strike or mechanical damage [i.e. aircraft strike]
- wind causing transmission lines to contact each other
- arc to ground and arc between conductors caused by ionise particles in dense bushfire smoke
- heat causing power lines to sag and connect with the ground/vegetation/ structures
- lightning strikes
- human error – faulty installation
- failure of power line including breakage of wires, poles, cross arms, insulators and associated equipment
- pole-top fires caused by dust build up on insulators, causing arcing from the conductor to the tower/cross arm
- arcing to ground through smoke plumes; and
- electrically induced fire – current or voltage transfer due to fault and failure of the earthing system at transmission line structures.

An inhibitor to effect firefighting

Electricity towers impede firefighting efforts on the ground and in the air.

High Voltage powerlines effectively stop the management of bushfires in the vicinity because the space over and under powerlines are no go zones for firefighters.

Further, many of the dams that have been used to refill aerial firefighting fleet in southern NSW are not accessible. Nowadays these are some of the commonly used methods of fire control.

The NSW Rural Fire Service Pocketbook notes that 25 metres from the outer wire is a no-go-zone for vehicles and personnel if fire or smoke is approaching a transmission line.

This is based on the fact that flame and smoke may cause a deadly arc from one wire to another or to the ground.

In fact the Pocket Book, dedicates eight pages to safety instructions and impediments to fighting fires around electricity assets, stating the areas under transmission lines are a “no go zone for vehicles and personnel if fire or smoke within 25 metres of outer wire”.²⁵

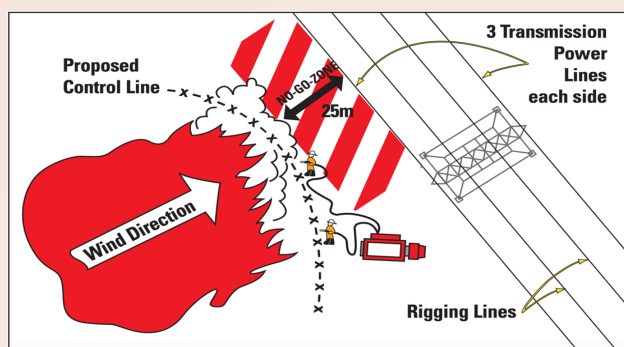


Figure 1: NSW Rural Fire Service Firefighters Pocket Book, December 2010

Similar messages can be found in firefighting safety pamphlets around the world, including Australian power companies.^{26,27}

Southern California Edison Fire Management practices however recommends the minimum safe distance to powerlines involved in a wildland fire is 1 ½ times the height of the pole or tower. If this was adopted in NSW, this would make the no go zone some 125 metres either side of the proposed overhead HumeLink transmission line.

In a paper, *The Threat Caused By Fires Under High Voltage Lines*, the effect of fires on the flashover voltage of power lines has been investigated in Brazil, Mexico, Canada, USA, South Africa, Australia and Poland.²⁸ The flashover voltage of outdoor insulation is reduced by hot air, conductive flame and colloidal smoke. The paper explains the extreme safety risks for firefighters and other people from arcing where overhead lines are present.

The South California Edison fire handbook also points out the risk of electricity towers on air-borne firefighting operations, urging pilots to be aware of all dangerous power lines in and around the fire area.²⁹

“These transmission lines can not only cause fires, but also contribute to the chaos in a bushfire emergency.”

Rebecca Tobin, Darlow Local



Andrea Sturgess

Andrea and Paul Sturgess' property near Batlow was devastated in the Dunn's Road fire, which saw 162 homes lost.

Like many others, Andrea and Paul were told they had to fend for themselves because of two existing overhead electricity transmission lines that crossed her property prevented land and air access by fire crews.

"We were told we were on our own because of the transmission lines," said Andrea.

Now they face the prospect of a third, much bigger line, crossing the property if HumeLink is built overhead.

"There's no way known we could defend our property in a fire if HumeLink goes ahead as planned, said Andrea.

"The State and Federal Governments, the electricity regulators and Transgrid needs to listen to our very real concerns and underground HumeLink. It's the safest option for us and for our future generations."



Rebecca Tobin

Rebecca Tobin is terrified about the prospect of defending her family property in Darlow from bushfire if HumeLink is built.

Having lived through the January 2020, Dunn's Road fire, Rebecca said she cannot believe the Government and Transgrid would put families at further risk with HumeLink.

"It's unconscionable that we are putting people further at risk," she said. "There will be huge areas of our property that we simply can't defend because the Rural Fire Service stipulates that is too dangerous around transmission lines, by ground and by air."

"These transmission lines can not only cause fires, but also contribute to the chaos in a bushfire emergency."

The community costs of fires

Deloitte Access Economics put the tangible and intangible costs of the Victoria Black Saturday bush fires at \$7.6 billion³⁰

By extrapolation, the cost of the 2019-20 Australian bush fire season, 'Black Summer', has been estimated at \$230 billion.³¹

The Fire on the Farm report by the World Wide Fund for Nature-Australia and the University of Sydney estimates the 2019-20 bushfires cost agriculture \$4 to 5 billion. Costs include damage to farm buildings and equipment, and a reduction in farmland values (estimated at \$2-3bn); loss of crops and over 100,000 livestock

deaths (around \$2bn); and health impacts from smoke inhalation by farmers and other food workers (at least \$279m).³²

In the US in 2019, to escape the billions of dollars from claims of fire victims, energy company PG&E filed for bankruptcy. Rather than spark any more fires, the public power utility decided it was better to just shut off in some areas. The company is now undergrounding, using wildfire risk modelling to look ahead, announcing a



plan in 2021 to bury 10,000 miles of power lines and equipment in areas with high fire risk.

The announcement came after the company's equipment caused numerous large, deadly and destructive wildfires, liability lawsuits and bankruptcy. PG&E's modelling shows burying lines reduces their risk of igniting wildfires by approximately 99 percent, and the company's undergrounding plan eliminates 70 percent to 80 percent of the ignition risk in high-fire districts.^{33,34}


Increasing the likelihood of these catastrophic costs, needs to be factored into the costs of overhead transmission lines, when comparing options. Conversely, decreasing the likelihood of these catastrophic costs, needs to be factored into the benefits of undergrounding transmission lines, when

comparing options.

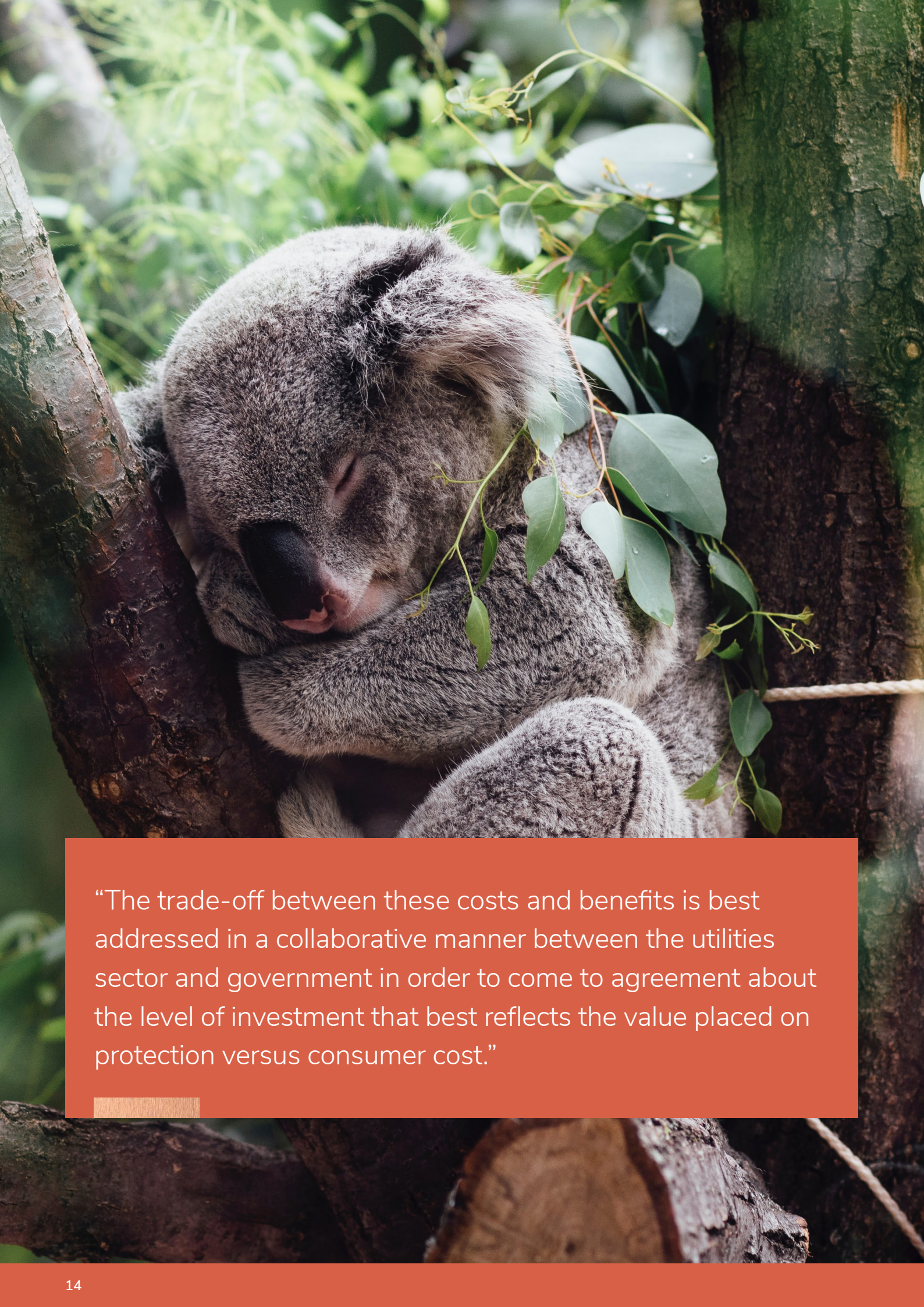
There is also a significant and ongoing cost to the community in failing to build proper infrastructure that guarantees access to reliable, renewable energy supplies. On this point Trangrid's HumeLink is a big fail when it comes to bushfire resilience.

In fact, the Australian Energy Market Operator's (AEMO) 2022 Integrated System Plan (ISP) insists (Appendix 8. Resilience and Climate Change page 15) that any new infrastructure does not lead to unsustainable deterioration in grid resilience.

How is building a multi-billion dollar overhead transmission line along a bushfire-prone corridor not a prime example of resilience deterioration that will lead to ongoing and regular network outages during climate change?



Modelling shows that burying lines reduces their risk of igniting by approximately 99 percent.



“The trade-off between these costs and benefits is best addressed in a collaborative manner between the utilities sector and government in order to come to agreement about the level of investment that best reflects the value placed on protection versus consumer cost.”

Undergrounding transmission lines eliminates risk

Government investigations and Inquiries in Australia and around the world, recognise that one of the most effective ways to reduce the risks from powerlines is taking them underground.

Following investigations into the cause of two significant fires in WA during the Black Summer fires, network operator Western Power replaced over 50km of burned lines with standalone solar, generator, and battery systems, accelerating its long-term plan to reduce regional WA's reliance on overhead lines.

The NSW Inquiry, in recognition that high voltage overhead powerlines are a hazard that can lead to bushfires, notes that putting powerlines underground makes them more resilient to bush fire damage and therefore more reliable during a bushfire.

Noting that the costs of undergrounding could be a barrier, it says that for bushfire prone areas, underground networks could be considered.

Though it says; "The trade-off between these costs and benefits is best addressed in a collaborative manner between the utilities sector and government in order to come to agreement about the level of investment that best reflects the value placed on protection versus consumer cost."

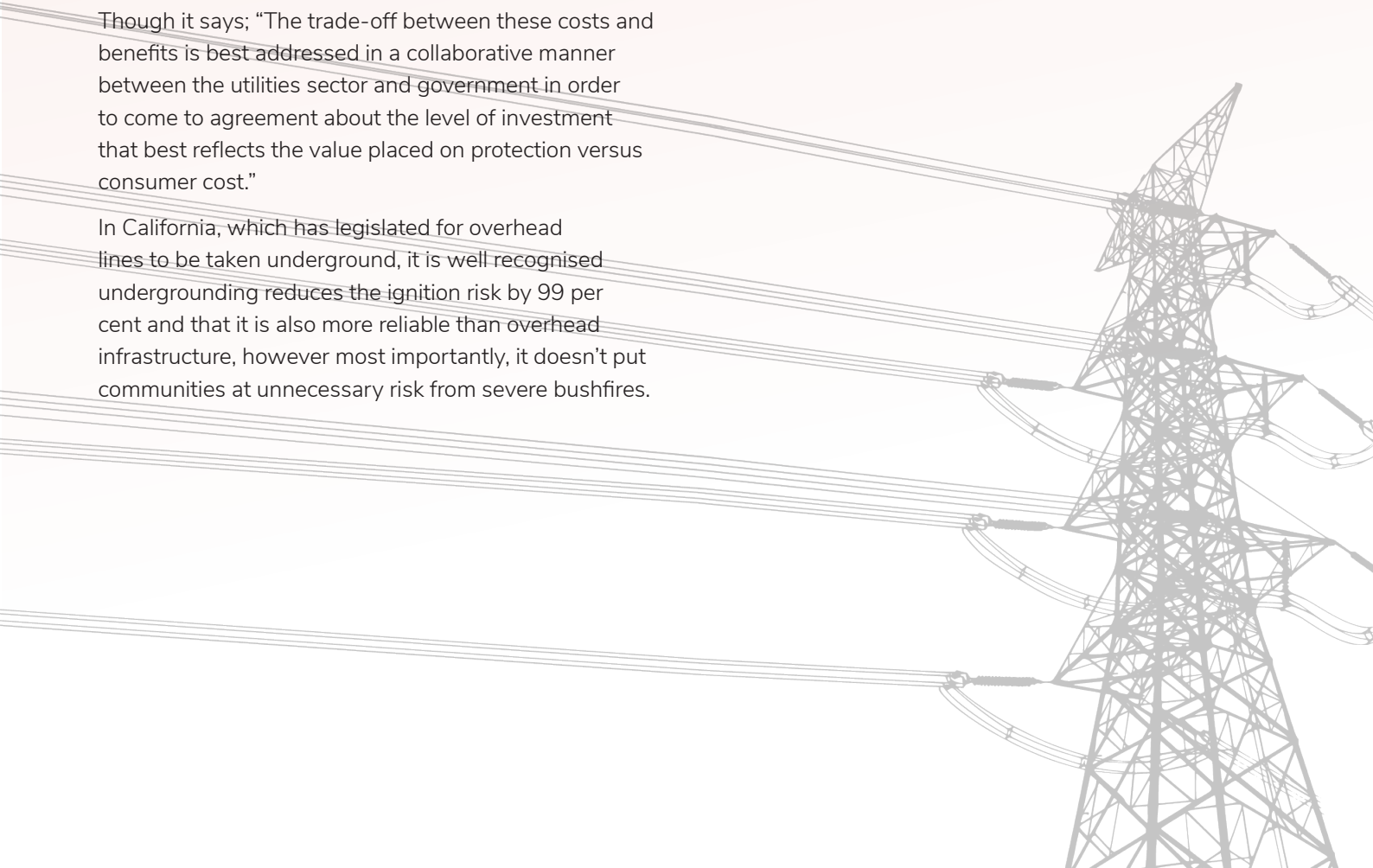
In California, which has legislated for overhead lines to be taken underground, it is well recognised undergrounding reduces the ignition risk by 99 per cent and that it is also more reliable than overhead infrastructure, however most importantly, it doesn't put communities at unnecessary risk from severe bushfires.

According to California Public Utilities Commission (CPUC), California has approximately 25,526 miles of transmission lines, and approximately 239,557 miles of distribution lines, of which approximately 147,000 miles of distribution lines are overhead.

CPUC is now undergrounding electric transmission and distribution lines to make bushfire prone areas safer and to elevate property value in communities.

Its largest electricity provider Pacific Gas and Electric (PG&E) is undergrounding its high-risk power distribution lines to curb bushfires. The company has estimated about 3,600 miles will be completed from 2022 to 2026.

When all 10,000 miles are underground, risk will be reduced by 70 to 80 percent in high fire-threat districts. It has already completed undergrounding of initial 175 miles (280kms).



Conclusion

There can be no doubt that overhead transmission lines increase the risk of bushfires, and this risk is increasing further with climate change. They also severely hamper the ability to control and manage fires caused by other factors and cause significant reliability issues for Australia's energy supply.

Based on this, communities demand that governments at all levels, energy regulators and network developers such as Transgrid ensure that future transmission projects are built as underground cables. This includes the 360 Kilometre HumeLink.

As seen in California this one-off investment would eliminate ignition risk and significantly reduces current reliability issues, when power is regularly shut off to communities during bushfire events.

While the cost of undergrounding continues to be wildly exaggerated by Transgrid and others, there is no doubt that upfront costs will be higher but will also lead to significant reductions in costs over the medium to long term due to the elimination of bushfire risks and significantly reduced maintenance, as well as much better network reliability and efficiency.

As such, we believe the funding for undergrounding could and should be subsidised by government, rather than energy users, because of the obvious long-term benefits this vital

infrastructure will provide to our entire community in terms of safety, reliability, and environmental outcomes. It will also reduce Government and taxpayer exposure to the impact of bushfires being caused by the proposed overhead transmission lines.

These issues require urgent decision making from policy-makers who have the vision and conviction to properly invest in Australia's long-term sustainable energy future.

Governments must shoulder the burden when there is market failure to capture the direct and indirect costs caused by public goods which are required to achieve public goals.

The urgent need to transition to renewable energy is undeniable. The question going forward is, how do we do it in a way that gives the best chance of meeting this goal without doing further harm. We want the legacy of this period of intense action to look, not only good but, brilliant in 2023 and still look visionary in 2050.





Endnotes

- 1 HumeLink Community Consultative Group 6th meeting
- 2 <https://www.scientificamerican.com/article/fires-doubled-australias-carbon-emissions-ecosystems-may-never-soak-it-back-up/#:~:text=They%20conducted%20the%20study%20using,doubled%20Australia%27s%20annual%20carbon%20footprint>
- 3 <https://minister.dcceew.gov.au/bowen/speeches/annual-climate-change-statement-parliament>
- 4 <https://www.theguardian.com/australia-news/2019/dec/11/doing-nothing-is-not-a-solution-nsw-environment-minister-blames-climate-crisis-for-bushfires>
- 5 <https://www.abc.net.au/news/2022-08-26/black-summer-bushfires-caused-ozone-hole/101376644>
- 6 https://parlinfo.aph.gov.au/parlInfo/download/library/prspub/7234762/upload_binary/7234762.pdf
- 7 <https://www.dpc.nsw.gov.au/assets/dpc-nsw-gov-au/publications/NSW-Bushfire-Inquiry-1630/Final-Report-of-the-NSW-Bushfire-Inquiry.pdf> (pg 29)
- 8 http://royalcommission.vic.gov.au/finaldocuments/summary/PF/VBRC_Summary_PF.pdf (pg 29)
- 9 <https://drive.google.com/file/d/1HWaijjBTGFRZjt5BOxO3eYyNS99ds3Gh/view>
- 10 <https://insideclimatenews.org/news/11072022/is-burying-power-lines-fire-prevention-magic-or-magical-thinking/>
- 11 [https://esv.vic.gov.au/news/esv-charges-united-energy-for-major-line-clearance-breaches-in-high-bushfire-risk-areas/#:~:text=Energy%20Safe%20Victoria%20\(ESV\)%20has,east%20and%20the%20Mornington%20Peninsula](https://esv.vic.gov.au/news/esv-charges-united-energy-for-major-line-clearance-breaches-in-high-bushfire-risk-areas/#:~:text=Energy%20Safe%20Victoria%20(ESV)%20has,east%20and%20the%20Mornington%20Peninsula)
- 12 <https://www.heraldsun.com.au/news/victoria/fire-failure-trees-left-to-clash-with-powerlines-and-spark-bushfires/news-story/e190d083230f22b07049948fd53e2edb>
- 13 <https://www.heraldsun.com.au/news/victoria/fire-failure-trees-left-to-clash-with-powerlines-and-spark-bushfires/news-story/e190d083230f22b07049948fd53e2edb>
- 14 http://royalcommission.vic.gov.au/finaldocuments/summary/PF/VBRC_Summary_PF.pdf
- 15 <https://www.abc.net.au/news/2014-10-17/remembering-the-blue-mountains-bushfires-one-year-on/5819100#:~:text=Destroying%20196%20homes%2C%20the%20fires,sustained%20by%20132%20more%20homes>
- 16 <https://www.latimes.com/california/story/2021-08-08/dixie-fire-now-second-largest-wildfire-california-history>
- 17 <https://www.sciencedirect.com/science/article/abs/pii/S0169204617301548>
- 18 <https://www.sciencedirect.com/science/article/abs/pii/S0169204617301548>
- 19 http://royalcommission.vic.gov.au/finaldocuments/volume-2/HR/VBRC_Vol2_Chapter04_HR.pdf
- 20 <https://www.dpc.nsw.gov.au/assets/dpc-nsw-gov-au/publications/NSW-Bushfire-Inquiry-1630/Final-Report-of-the-NSW-Bushfire-Inquiry.pdf>
- 21 <https://www.energynetworks.com.au/resources/fact-sheets/bushfire-factsheet-2020/>
- 22 <https://www.sciencedirect.com/science/article/abs/pii/S0169204617301548#:~:text=The%20occurrence%20of%20wildfires%20caused,lives%20and%20assets%20of%20value>
- 23 <https://www.sciencedirect.com/science/article/abs/pii/S0169204617301548>
- 24 <https://www.transgrid.com.au/media/1p4hon05/tp-10-bushfire-impact-assessment.pdf>
- 25 http://yassriverbfb.org/resources/NSW_RFS_Pocketbook.pdf
- 26 https://www.ergon.com.au/__data/assets/pdf_file/0009/496971/EGE190708-industry-brochure-fire-and-high-voltage-DL.pdf
- 27 <https://www.essentialenergy.com.au/-/media/Project/EssentialEnergy/Website/Files/Safety/fire-safety-fact-sheet.pdf>
- 28 https://www.researchgate.net/publication/234058061_The_threat_caused_by_fires_under_high_voltage_lines
- 29 https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3838361.pdf
- 30 https://www.supremecourt.vic.gov.au/sites/default/files/2018-11/deloitte_access_economics_bushfires_report.pdf
- 31 https://www.supremecourt.vic.gov.au/sites/default/files/2018-11/deloitte_access_economics_bushfires_report.pdf
- 32 <https://www.wwf.org.au/news/news/2021/horror-bushfire-season-cost-aussie-farmers-up-to-5-billion#gs.m7oqvm>
- 33 <https://www.engineering.com/story/california-is-on-fire-again>
- 34 <https://insideclimatenews.org/news/11072022/is-burying-power-lines-fire-prevention-magic-or-magical-thinking/>



Contact us anytime:
stophumelinktowers@gmail.com
www.stophumelink.com.au

A joint commissioned report by the HumeLink Alliance
and HumeLink Action Group